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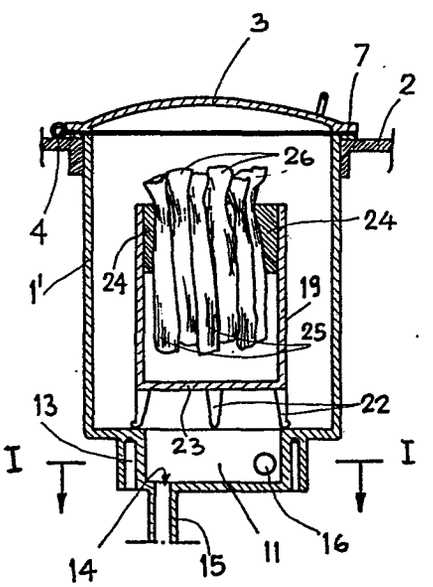
(54) Device for softening leather products.

(57) Device for softening leather products, particularly shoe uppers, comprising: at least a sealed container (1') containing a holder (19) for the product to be treated, an air pump, means feeding vapour or water nebulized with compressed air and ducts (15) and (16) connecting respectively said feeding means and air pump to the container.

The container (1') is provided, on the base, with a box (11) containing an electrical resistance, heating rods arranged on its periphery (13) and openings (14) and (16) connected to the air pump and to vapour or nebulized air.

The holder (19) may be a reticular support or a second container having an upper opening covered by a thick layer (24) of a compressible elastic material.



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DEVICE FOR SOFTENING LEATHER PRODUCTS

The present invention relates to a device for softening leather products, and particularly shoe uppers.

It is known that for some assembly operations however, the leather products and particularly the shoe uppers, are required to be softenend in order to make easier the subsequent processings.

The known softening processes, which are generallu carried out by means of superficial moistening, present some undesired drawbacks. In particular, the superficial moistening of leather renders very difficult, discontinuous and ineffective the subsequent application of glues or thermoplastics, required or the following operations.

These products, in fact, in order to guarantee optimum performances must be applied on perfectly dry surfaces.

In addition, the moistening can cause undesirable variations to the surface structure of the leather which may be rejected as a defective products.

The object of the present invention, is to provide a device for the softening of leather products, in particular shoe uppers, that consents to remedy these drawbacks.

More particularly, the object of the present invention is to provide a device which makes possible to obtain a perfect softening of the leather products, particularly shoe uppers, by maintaining perfectly dried the outer and inner surfaces of the leather product so as to assure a perfect and complete adhesion thereto of the glues or thermoplastics materials.

Another object of the present invention is to provide a

device for the softening of leather products in general, and shoe uppers in particular, which does not produce any superficial deformation or variation of the leather structure and consents an easy and regular processing of the leather products in the successive operation phases.

Still another object of the present invention is to provide a device for the softening of leather products which is simple and functional of economic realization and suitable for processing shoe uppers in particular.

According to the present invention, the above and other objects are obtained by a device for softening leather products, and particularly shoe uppers, comprising at least a sealed container provided with at least two ducts connected respectively to an air pump and to means feeding vapour or water with compressed air.

The vapour or water duct is alligned to a heating source which optionally extends to other surrounding areas of the container.

The container is provided with an inner holder which may be a reticular support for leather products in general and particularly for the shoe uppers, or a second inner container for the boots and leggings, sealed at the bottom and provided with a periferical elastic bordering at the upper opening.

Said reticular support and/or the second container which are inserted into the containers, are preferebly arranged on a support structure which comprises an emptying gearbox, a water tank, electrical gearbox having a control panel, and it is connected to a vapour or compressed air generator.

The device of the present invention can operate

independently or can be integrated into the assembly lines of leather products, particularly footwear.

In order to better understand the present invention, it is described in detail below with reference to drawings which illustrate only one specific, preferred and not limitative embodiment, in which:

- figure 1 represents a prospective view of the device of the present invention provided with two containers;
- figure 2 represents a schematic view of the cross-section of a container containing a supplementary vat;
- figure 3 represents a schematic view of the transversal section of the container of figure 2, obtained by a plane passing through the line I-I; and
- figure 4 represents a schematic view of the cross-section of a container containing a reticular support.

The figures show a device for softening leather products comprising essentially two or more containers 1.

In the illustrated example, the containers 1 are two arranged on a support structure 2.

They can be provided with independent covers 3 which may be manually or automatically upward openend around pins 4.

As an alternative, the cover 5 may be only one turning on pin 6, and moving from a container to the adjacent one according to the operating cycle, as indicated by arrow 20 in figure 1.

The use of only one cover 5 can be justified by a continuous working cycle, wherein one container is in operation when the other is open for the unloading of the treated products and the loading of those to be treated.

At the end of the loading operation, the first container

will have finished the softening operation and so the cover 5 can be turned on the loaded container, whereas the open container can be unloaded and reloaded. Each cover 3 or 5 is in any case provided with a peripheral weather strip 7.

In the support 2 are preferably arranged: a space 8 including an air pump with the relevant organs and connections for its working, an electrical panel 9 comprising all the command organs, the electrical devices or electronics for the automatic programming of the working cycle, and a water tank 10 with refilling mouth 21. The tank 10 is connected either to the vapour producing boiler, or directly to the containers 1 together with the ducts of the compressed air produced by an integrated autonomous compressor, or by an external distribution plant.

Each container 1 is preferably of cylindrical form and provided on the base, with a box or protension 11, which is also preferably cylindrical, in which an electrical resistance 12 is inserted.

The box 11 is provided in its periphery with a plurality of ports 13 wherein heating rods are arranged. The box 11 is also provided in its base with a discharge opening 14 with manifold 15 connected to the suction pipe of the air pump.

Tangentially to the box 11 is provided a second inlet opening 16 having the manifold 17 connected to a vapour producing boiler or, preferably, to a duct of compressed air and water coming from the tank 10.

When the present device is used for softening the shoe uppers, they are inserted into the containers 1 placed on the reticular support 18. Once the covers 3 have been closed, a high vacuum is carried out in the inside of the

containers 1, so as to remove air and impurities, also from the pores of the leather.

The vacuum is obtained by means of a pump (not illustrated in the figures) connected to the maniforld 15 of the opening 14.

Through manifold 17 and opening 16, into the container 1, is fed water vapour or water coming from the tank 10 and nebulized with compressed air.

Nebulized water is preferred since it is more economic to produce.

The nebulized water or vapour, enters tangentially into the lower box 11 through opening 16.

The nebulized water flux under pressure, forms a vortix tangent to the walls of the internal box 11 and comes into contact with the electric resistance 12 and it is heated.

The heated nebulized water upwardly moves ccovering the shoe uppers which are placed on the reticular support 18.

The behaviover of the vapour is the same as the nebulized water.

The nebulized water, passing through resistenca 12, evaporates and penetrates into the leather pores emptied in the preceeding phase, while the outer surface of the shoe uppers and the relative linings remain dry, due to the heating obtained in the containers 1 by resistance 12 and the supplementary heating rods arranged in ports 13.

In this way, the counterforts and toes of the shoe uppers are moistened and softened, so that in the successive assembly phases will be more easily adherable to the base of the forms, without folds or defects.

The outer surfaces, which are perfectly dry, guarantee a

sicure application of glues or/and thermoplastic materials.

The softening of the uppers carried out by the device of the present invention, not only makes possible an easy performance of the folds and a perfectly adaption of the toe and counterforts on the forms, but also avoids the templating of the counterforts, since the intrisic softening of the product is so as to facilitate a perfect adherence to the forms and the tacking of the soles, leaving the corners perfectly glued to the profile of the form, without wrinkles.

As far as the softening treatment of the boot uppers and leggings are concerned, a differente holder 19 is used.

The holder 19 is provided with feets 22, a base 23 side walls, and an upper opening covered by a thick layer of a compressible elastic material 24.

From the central port of the elastic layer 24, the legs 25 of the boots and leggings are inserted into the holder 19 leaving the uppers 26 to protende towards the exterior and upwards.The holder 19 is thereafter inserted into containers 1', which are necessarily longer than the ones used for shoe uppers only or, generally, for leather products.

The containers 1' may be used also for shoe uppers or leather products.

The uppers 26 are subjeted to the same process phases, comprising vacuum and vapour or nebulized water under pressure treatments.

The legs 25, on the contrary, are protected by means of the side walls and the base 23 of the holder 19 and by the layer of elastic material 24, which adheres the necks of the boots between the uppers 26, and the legs 25.

The devices for softening leather products and in particular those for the softening of shoe uppers of the present invention may be made with one or more containers 1 and 1'. The devices provided with more than one container may be constituted of all the containers 1, all containers 1', or of mixed containers.

The device of the present invention for softening leather products and shoe uppers in particular, has been illustrated and described herein above according to a preferred embodiment with containers 1 or 1' having a cylindrical shape and with upper opening. It is evident that the same inventive concept may be applied also to different types of containers, for example, having a cubic, parallelepiped or polygonal shape with upper, frontal or lateral opening. Containers 1 or 1' may be also horizontally or obliquely oriented with frontal or side opening; in these arrangements, both electrical resistances 12 and reticular support 18 take different shapes in order to promote the heat radiation and to facilitate the inlet and outlet of the products to be treated. Particularly, electrical resistances 12 are arranged on the bottom or on the lower of the containers and the supports are settled thereon. Moreover, the electrical resistances and the supports are oriented in a substantially parallel position with respect to the containers.

The present device may be manually used in its more economic embodiment, or by an automatic control operated by a programm, which may be independet or integrated to the assembly cycle of the leather products, particularly shoes.

CLAIMS

1. Device for softening leather products, particularly shoe uppers, by a superficial moistening treatment, characterized in that it comprises at least a sealed container containing a holder for the product to be treated, an air pump, means feeding vapour or water nebulized with compressed air and ducts connecting said feeding means and the air pump to the container inner.

2. Device according to claim 1, characterized in that it comprises at least a sealed continer containing a holder for the product to be treated, an air pump, a vapour producing boiler and ducts connecting the boiler and the air pump to the container inner.

3.Device according to claim 1, characterized in that it comprises at least a sealed container containing a holder for the product to be treated, an air pump, a water tank, a compressed air generator and ducts connecting the water tank with the compressed air generator and the air pump to the container inner .

4. Device according to any of the preceeding claims, wherein the container is provided, on the base, with a box containing an electrical resistance and heating rods arranged on its periphery.

5. Device according to claim 4, wherein the box is provided with two openings connected, respectively, to the suction pipe of the air pump and to the vapour producing boiler or to the duct of air compressed and water.

6. Device according to claim 4 or 5, wherein the opening connected to the vapour producing boiler or to the duct of air compressed and water is tangential to the box wall.

7. Device according to any of the preceeding claims, wherein the holder for the leather product is a reticular support.

8. Device according to any of the preceeding claims from 1 to 6, wherein the holder for the leather product is a second inner container having a base provided with feets, side walls and an upper opening covered by a thick layer of a compressible elastic material.

9. Device according to any of the preceeding claims, wherein the containers and the holders have cylindrical, cubic, parallelepiped or polygonal shape.

10. Device according to any of the preceeding claims, wherein the containers are vertically arranged with upper opening.

11. Device according to any of the preceeding claims from 1 to 8, wherein the containers are horizontally or obliquely oriented with frontal or side opening.

12. Device according to claim 10, wherein the electrical resistances and the supports are oriented in a substantial parallel position with respect to the containers.

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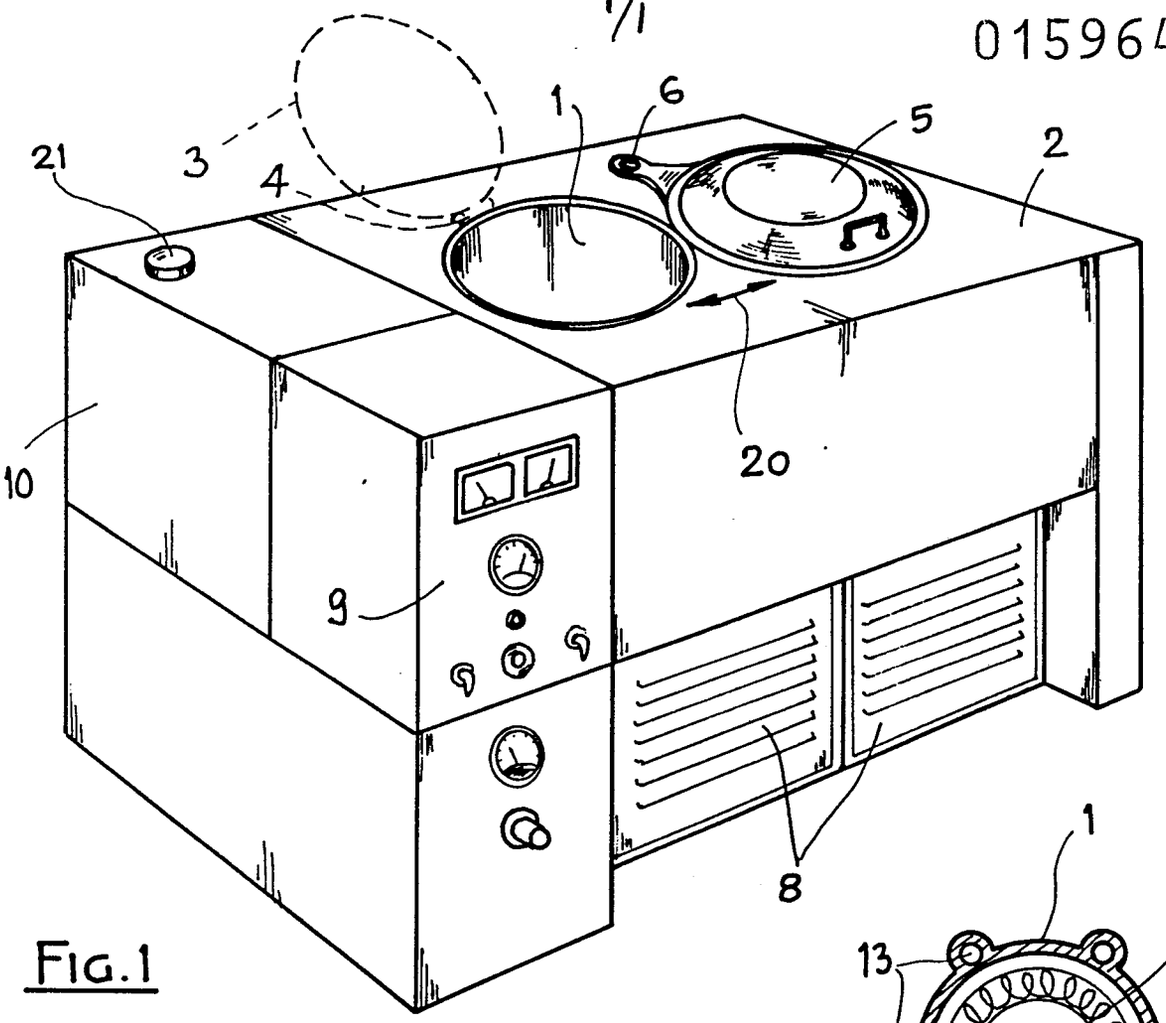

FIG.1

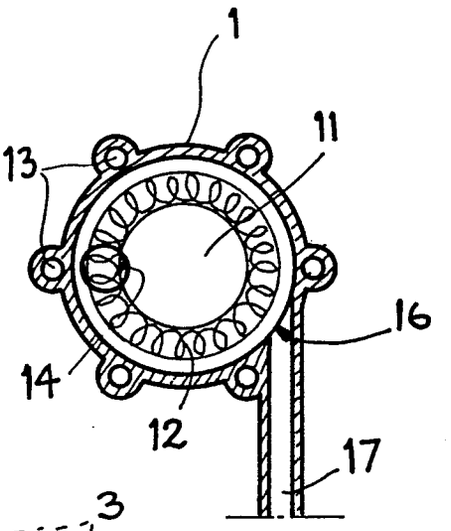

FIG.3

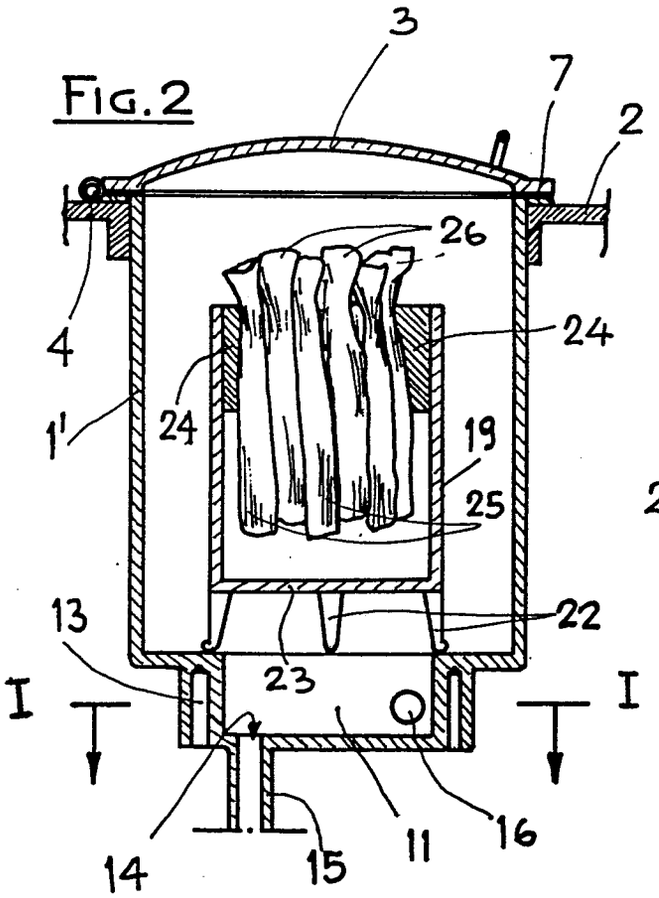

FIG.2

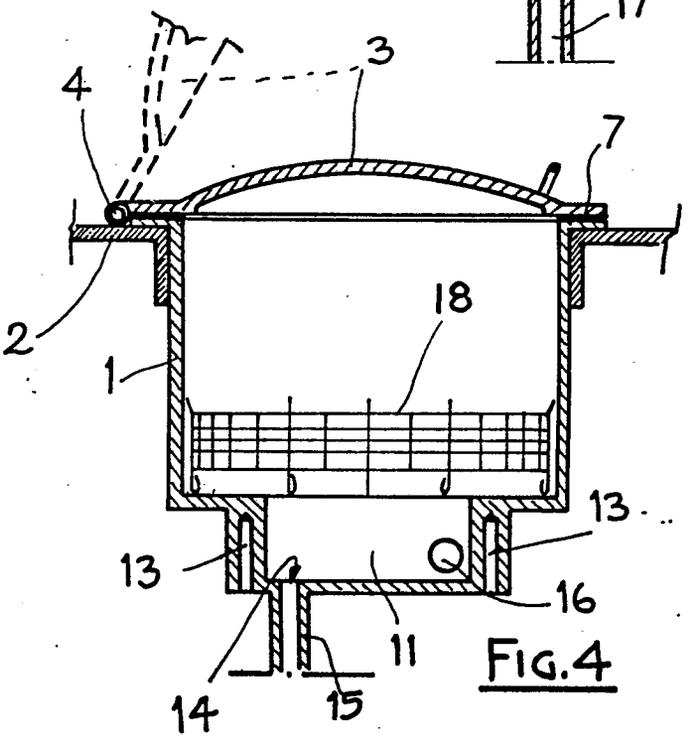

FIG.4